

S/N 10/539,758

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	ANTONISSEN et al.	Examiner:	YANG, Jie
Serial No.:	10/539,758	Group Art Unit:	1793
Filed:	December 23, 2005	Docket No.:	09997.0124USWO
Customer No.:	23552	Confirmation No.:	6616
Title:	STEEL COMPOSITION FOR THE PRODUCTION OF COLD ROLLED MULTIPHASE STEEL PRODUCTS		

Filed EFS-WEB

DECLARATION UNDER 37 C.F.R. § 1.132

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

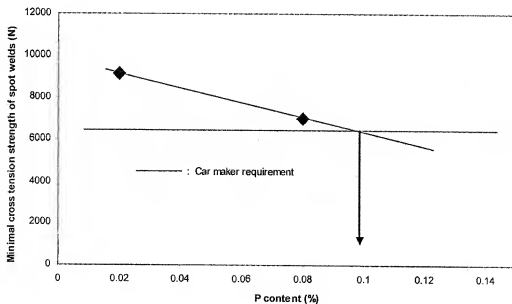
Dear Sir:

1. I, Joachim Antonissen, declare and say as follows:
2. I have a masters in material science from Ghent University and 12 years of experience working in the field of metallurgical product development. I am an inventor on 3 patents in this field as well as author and co-author of several scientific papers and promoter of 2 PhD thesis related to this field.
3. I am an inventor of the U.S. patent application identified above. I have reviewed the Office Action dated October 8, 2010 including a rejection that the claims of this application are obvious over U.S. Patent No. 5,470,529 to Nomura et al. supplemented by U.S. Patent No. 6,589,369 to Yokoi et al. I respectfully disagree with the rejection, because the claimed cold rolled steel composition has minimum cross tension strength of spot welds that would have been unexpected before the present invention at the high levels of phosphorus and aluminum listed in the claims.
4. The following tests were conducted under my supervision.
5. Minimum cross tension strength of spot welds was measured in compositions of the claimed cold rolled steel. This type of strength is a known criterion for the assessment of

weldability, as a function of the P-content, in a steel sheet with varying P-content. The compositions of the steel samples used in these tests were as follows. For the test sample at 0.02wt% P: C : 0.2wt%; Mn : 1.5wt%; Si : 0.3wt%; Al : 1wt%. For the test sample at 0.08wt% P: C : 0.19wt%; Mn : 1.5wt%; Si : 0.3wt%; Al : 1.2wt%. In the cold-rolled steel composition of claim 1, the phosphor content is in a the range of 0.04-0.1wt%. The levels of S, N, Ti, Nb, V and B for both samples were also all within the ranges in claim 1.

6. The minimum cross tension strength of spot welds was measured by an accepted procedure. For the claimed cold rolled steel with 0.02 wt% P, the minimum cross tension strength of the spot weld was 9154 N. For the claimed cold rolled steel with 0.08 wt% P, the minimum cross tension strength of the spot weld was 7028 N.

7. The following graph puts a slanted line through these measured strengths to illustrate that the claimed cold rolled steel composition unexpectedly provides good weldability at P-levels well above the impurity level. It is particularly unexpected that we obtained good weldability at high levels of phosphorus with aluminium at 1 and 1.2 wt-%.

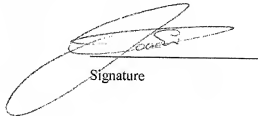


The horizontal line represents the minimum spot weld minimum cross tension strength required by a car maker. This graph also illustrates that above 0.1 wt% phosphorus weldability becomes unsatisfactory.

8. In contrast, the two patents cited in the rejection (Nomura et al. and Yokoi et al.) each discuss phosphorus as an undesirable impurity, to be minimized as much as possible. In addition, before our invention, it was believed that higher Al-levels tend to deteriorate weldability. Thus, on the basis of these references and what was known before our invention, I would conclude that 0.08wt% P in combination with 1.2wt% Al would not have led to an acceptable spot weld. Surprisingly, the claimed cold rolled steel produced strong spot welds.

9. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements are made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

Date: 08/03/2011



Signature